Course 607: Cisco Certified Network Professional (CCNP)

↘ Objectives

Students will comprehend the following upon completion of this course:

- Installing, configuring a network to increase bandwidth
- Maximizing performance through campus LANs, routed WANs and remote access
- Creating a global intranet
- Providing access security to campus switches and routers
- Providing increased switching and routing bandwidth, end-to-end resiliency services, and providing custom queuing and routed priority services

↘ Prerequisites

Students must have successfully taken and passed the CCNA exam.

↘ Books and Materials

- CCNP Certification Library by Clare Glough, et al 2003, Cisco Press ISBN: 1587201046

↘ Course Policies

Class attendance is mandatory for all students and will be enforced in accordance with the guidelines described in the school's Student Information Publication catalog. Students who miss a class with a valid excuse must arrange personal time with the instructor to make up any missed work and assignments. No software used in the course may be removed from the school premises and installed on personal computers at a student's home. Evaluation software will be provided for student's to use during the course if they wish to do additional work at home.

↘ Course Description

The CCNP course is designed for more advanced Cisco networks, CCNAs who want to progress to improve their net worth, recognition, and career opportunities, Level 1 Network Support individuals in a large enterprise; Central Operations staff who want to further develop their technical expertise. This advanced course teaches you the commands necessary for prioritizing and segmenting your network traffic. After successfully completing this course, you will be able to configure Cisco routers for operation in large or growing multi-protocol internetworks. The course includes laboratory exercises that focus primarily on scalable technologies and the Cisco software features that are most useful in building large or growing internetworks.

↘ Course Syllabus Breakdown

Part I: Routing Principles
- Routing Principles – review of distant vectoring and link state routing protocols, enabling RIP and IGRP on Cisco routers
- Introduction to OSPF, operation in a single area, operation in multi-area, address summarization, virtual links, stub, totally stub, not-so stubby area
- Enable OSPF on routers, and develop a routing tables, implement advanced features of OSPF

Part II: EIGRP Routing
- Cisco Enhanced IGRP routing protocol, implementation on local LAN, and WAN networks, Cisco hierarchical network structure, EIGRP stub feature
- ISIS routing protocol, NSAP addressing, Level area routing, security with ISIS, redistributing other protocols into ISIS, CLNP, CSNP

Part III: Border Gateway Protocol
- BGP routing protocol as Internet backbone protocol, autonomous system configuration, external BGP vs. internal BGP, neighbor relationship between BGP peers
- Confederation peers, route-reflectors, peer-groups, partial-mesh BGP, next-hop configuration, update-source, route-maps

Part IV: BGP Configuration
- Configuring BGP in an autonomous system between internal BGP peers, BGP configuration between external BGP peers
- Advanced access-list configuration, routing update control, routing protocol security, limiting access to routers, securing routers

Part V: Cisco Switched Internetwork
- Cisco 2950 switch operation, core switches, access switches, distribution switches, auto-sense Ethernet configuration, full-duplex Ethernet, multi-mode, single-mode fiber cable
- Configuring addressing for switches, connecting switches together, configuring STP, redundancy between switches, port channeling, trunk encapsulation, catalyst 5000

Part VI: MLS, HSRP
- Using MLS to enhance operation of LAN networks, configuring MLS, hardware and software requirement, configuring inter-VLAN routing, layer 3 switching, layer 4 switching
- Set up MLS between a router and switch, providing redundancy in a network using HSRP, verifying operation of HSRP

Part VII: Supporting Multi-Casting in a Network
- Shared-Tree, Source-Tree multicasting in a LAN network, using sparse, or dense mode, assigning designated forwarder on a LAN network, permitting a source to join a multicast tree, IGMP v1 vs. IGMP v2, CGMP, PIM configuration on an interface
- Configure a multicast source, and configure routers to join the multicast tree, specifying RP router to distribute multicast information in the network

Part VIII: Modem, ISDN
- Principles of operation for a modem, transmit and receive wires on a modem, modem support on a router, connecting modem to auxiliary port of a router, dialing into a router using a modem, ISDN with dialer profile, and dialer rotary group
- Configure modem call to a router, simulate ISDN network and enable calling between routers to exchange user data and routing updates

Part IX: Queuing, Frame Relay
- Queuing methods on a router, fair-queue, custom-queue, and priority queue, advantages and disadvantages of each method, operation of a frame-relay switch, DLCI configuration, frame-relay mapping

Part X: Troubleshooting a Cisco Router
- Troubleshooting methodology, describing network problem, problem solving steps, network mapping tools, debugging commands, network management tools, SNMP, RMON tools, troubleshooting catalyst switches